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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/757,394	01/15/2004	You-seop Lee	249/435	4953
27849	7590	09/27/2006	EXAMINER	
LEE & MORSE, P.C. 3141 FAIRVIEW PARK DRIVE SUITE 500 FALLS CHURCH, VA 22042			DO, AN H	
			ART UNIT	PAPER NUMBER
			2853	

DATE MAILED: 09/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/757,394

Applicant(s)

LEE ET AL.

Examiner

An H. Do

Art Unit

2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 15-20, 25 and 26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10, 21-24 and 27 is/are rejected.
- 7) ☒ Claim(s) 9 and 11-14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION

The Request for Reconsideration filed on 10 July 2006 has been acknowledged.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 and 5-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Suga et al (US 4,672,397).

Suga et al disclose in Figures 3-5 the following claimed features:

Regarding claims 1 and 7, a method of expelling a fluid from an inkjet printhead comprising: filling a nozzle (102) with a fluid (ink) using a capillary force (from 104); generating an ion wind by ionizing air (by air flow means 106) near an outlet (Figure 4, orifice 110) of the nozzle (102); and expelling the fluid from the nozzle (102) as the ion wind decreases a pressure around the outlet (110) of the nozzle (column 2, line 65 to column 3, line 6).

Regarding claim 5, wherein the ion wind flows toward the outlet (110) of the nozzle (102) and upward at a front portion of the outlet of the nozzle (Figure 4).

Regarding claim 6, wherein the ion wind flows in an inclined direction toward the front portion of the outlet of the nozzle (Figure 4).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2-4, 8, 10, 21-23 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suga et al (US 4,672,397) in view of Hotomi et al (US 5,144,340).

Suga et al disclose the following claimed features:

Regarding claim 8, an ink-jet printhead (Figures 3-5), comprising: a manifold (100) formed in a passageway plate (104) to supply ink; a nozzle (102) to be supplied with ink formed in a nozzle plate (plate where the nozzles 102 are formed) provided on the passageway plate (104), the ink being supplied by a capillary force (from 104); and an ion wind (by air flow means 106) to decrease a pressure near the outlet (110) of the nozzle (102) to expel the ink contained in the nozzle (Figure 4).

Regarding claim 10, wherein the ion wind flows toward the outlet (110) of the nozzle (102) and flows upward at a front portion of the outlet of the nozzle (Figure 4).

Regarding claim 21, wherein the nozzle (102) has a tapered shape in which a cross-sectional area of the nozzle decreases gradually toward the outlet of the nozzle (Figure 4).

Suga et al disclose the claimed invention except for reciting the following claimed features:

Further regarding claims 8 and 27, a ground electrode and a source electrode arranged near an outlet of the nozzle, the ground electrode and the source electrode forming an electric field due to an application of a voltage thereto.

Regarding claim 22, wherein the ground electrode and the source electrode surround the outlet of the nozzle.

Regarding claim 23, wherein a shape of the ground electrode and the source electrode is selected from the group consisting of circular, oval, and polygonal.

Hotomi et al teach in Figure 3 the following features:

Further regarding claims 8 and 27, a ground electrode (7 connected to ground) and a source electrode (7 connected to voltage source 8) arranged near an outlet of the nozzle (5), the ground electrode and the source electrode forming an electric field due to an application of a voltage thereto (column 7, lines 46-49).

Regarding claim 22, wherein the ground electrode and the source electrode (both electrodes 7) surround the outlet of the nozzle (Figure 3).

Regarding claim 23, wherein a shape of the ground electrode and the source electrode is selected from the group consisting of circular, oval, and polygonal (Figure 3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the ground electrode and the source electrode forming an electric field around the outlet of the nozzle due to an application of a voltage thereto, as taught by Hotomi et al into Suga et al, for the purpose of generating the electric field around the nozzle.

Regarding method claims 2-4, Suga et al as modified by Hotomi et al also therefore disclose a method of expelling ink in view of the fact that the above structure is taught.

5. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suga et al (US 4,672,397) in view of Hotomi et al (US 5,144, 340) as applied to claim 8 above, and further in view of Murakami et al (US 6,158,844).

Suga et al as modified by Hotomi et al disclose the claimed invention except for reciting the source electrode has a cross-sectional area smaller than a cross-sectional area of the ground electrode.

Murakami et al teach in Figure 14 the source electrode (15) has a cross-sectional area smaller than a cross-sectional area of the ground electrode (Figure 14 shows electrode 15 narrower than electrode 16).

It would have been further obvious to one having ordinary skill in the art at the time the invention was made to have the source electrode has a cross-sectional area smaller than a cross-sectional area of the ground electrode, as taught by Murakami et al into Suga et al as modified by Hotomi et al, for the purpose of varying the voltages being applied to the electrodes.

Allowable Subject Matter

6. Claims 9 and 11-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The primary reason for the allowance of claim 9 is the inclusion of the limitation of an ink-jet printhead that includes the ground electrode disposed adjacent the outlet of the nozzle and the source electrode disposed a predetermined distance from the ground electrode away from the outlet of the nozzle. It is this limitation found in the claims, as it is claimed in the combination of, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

The primary reason for the allowance of claims 11-14 is the inclusion of the limitation of an ink-jet printhead that includes a recess having a predetermined depth formed at a periphery of the outlet of the nozzle on a surface of the nozzle plate, the ground electrode and the source electrode being arranged within the recess. It is this limitation found in the claims, as it is claimed in the combination of, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

Response to Arguments

7. Applicant's arguments with respect to claims 1-12, 21-24 and 27 have been considered but are moot in view of the new ground(s) of rejection. The newly discovered prior arts of Suga et al (US 4,672,397) and Hotomi et al (US 5,144, 340) disclose the claimed invention as shown above.


Contact Information

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to An H. Do whose telephone number is 571-272-2143. The examiner can normally be reached on Monday-Friday (Flexible).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on 571-272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AD
September 21, 2006


An H. Do
Primary Examiner
Art Unit 2853